

link that has at least one span of transmission fiber for carrying the optical data signals, comprising:

a Raman pump that produces Raman pump light at first and second wavelengths to create Raman gain for the optical data signals in the span of transmission fiber, wherein the first wavelength is different than the second wavelength;

an optical monitor that measures backscattered Raman pump light from the span of transmission fiber at the second wavelength; and

a control unit that uses the Raman pump and the optical monitor to perform optical time domain reflectometry measurements on the transmission fiber using a pump and probe arrangement in which the Raman pump light at the second wavelength is pulsed to perform optical time domain reflectometry measurements while the Raman pump light at the first wavelength is modulated to measure the effects of adjusting the Raman gain produced by the Raman pump light at the first wavelength in the span of transmission fiber.

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